

SUBSTITUTE SPECIFICATION

BUILT-IN WALL WATER SERVICE BOX

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Technical Field

The present invention relates to built-in wall water service boxes and, more particularly, to a built-in wall water service box, which includes a case, having a flexible hose, which couples a soft pipe to a water tap, and a cover plate which openably closes
10 the case, and in which the flexible hose is coupled at a first end thereof to the soft pipe, which is covered with a bellows pipe, using a first reducing socket, and coupled at a second end thereof to the water tap, and the cover plate has a frictional protrusion thereon and a repair hole therein, with a rim part provided on the cover plate around an edge of the repair hole, so that an openable plate is removably coupled to the rim part,
15 and in which a second reducing socket, which is coupled to a connection pipe of the water tap, is inserted into a socket insertion port formed at a predetermined position through the openable plate and maintains a position thereof using a stop protrusion, which is provided at a predetermined position on the openable plate, and the second reducing socket is integrally coupled to the second end of the flexible hose.

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Background Art

Generally, when buildings, such as residential buildings and apartment buildings, are constructed, or old buildings are renovated, cold and hot water pipes are guided from the outside to a distribution box, previously installed below a vanity sink, near built-in
25 furniture, or at a predetermined position in a dressing room. Furthermore, the cold and hot water pipes extend to desired locations, for example, a bathroom, a boiler room, a multi-use room, etc.

Herein, each of the cold and hot water pipes, which are connected to desired locations from the distribution box, has a structure in which a flexible inner pipe is
30 inserted into a corrugated cover pipe, which is a bellows pipe. The cold and hot water

pipes having the above-mentioned structure are supplied to water service boxes of desired locations, such as a bathroom, a multi-use room, etc., through floors of rooms and the kitchen. Connection pipes are connected to the water service boxes which are installed at the desired locations, thus supplying cold and hot water to cold and hot water
5 lines of a bathtub, a washstand and a toilet.

However, in the conventional piping system, it is difficult to repair the piping system after the construction of the piping system has been completed. That is, it is difficult to inspect the cold/hot water pipeline or the water service box embedded in the floor when there is damage to and/or water leakage from the cold/hot water pipeline or
10 the water service box. Furthermore, a worker may have to pull up the floor before inspecting the pipeline or the box in detail. After completing the inspection, the pipeline or the box must be embedded in the floor again.

Recently, in order to overcome the problems of the conventional method, in which the water service box is embedded in the floor or the ground, a method, in which a
15 water service box is embedded in a wall adjacent to a desired location such as the bathroom, has been proposed.

However, the water service box, directly encased in the wall, has the cold/hot water pipeline passing through an inner space thereof and connection pipelines between multiple water service boxes which are made of metal or synthetic resin and have the
20 general form of several pipes, and the pipes are individually separated when examination of the interior condition of the water service box or repair work thereto is required, and then, after the work is finished, are combined together in the reverse order.

Accordingly, such a water service box has drawbacks such as service thereto being inconvenient, taking a long time, and needing a complicated procedure of
25 dismantling the water service box during the working process and of reassembling it again in reverse order.

Disclosure of Invention

Accordingly, the present invention has been made keeping in mind the above
30 problems occurring in the prior art, and an object of the present invention is to provide a

built-in wall water service box, which includes a case, having a flexible hose, which couples a soft pipe to a water tap, and a cover plate which openably closes the case, and in which the flexible hose is coupled at a first end thereof to the soft pipe, which is covered with a bellows pipe, using a first reducing socket, and coupled at a second end thereof to the water tap, and the cover plate has a frictional protrusion thereon and a repair hole therein, with a rim part provided on the cover plate around an edge of the repair hole, so that an openable plate is removably coupled to the rim part, and in which a second reducing socket, which is coupled to a connection pipe of the water tap, is inserted into a socket insertion port formed at a predetermined position through the openable plate and maintains a position thereof using a stop protrusion, which is provided at a predetermined position on the openable plate, and the second reducing socket is integrally coupled to the second end of the flexible hose.

Brief Description of the Drawings

The above object, features and advantages of the present invention will become more apparent to those skilled in the related art from the following detailed description for preferred embodiments taken in conjunction with the accompanying drawing,

FIG. 1 is an exploded perspective view illustrating a built-in wall water service box according to the present invention;

FIG. 2 is a sectional view illustrating the water service box of the present invention;

FIG. 3 is an enlarged view of a circled portion A of FIG 2;

FIG. 4 shows an alternative example of flexible hose mounted on the water service box according to the present invention;

FIG. 5 is a view showing the mounting structure of a reducing socket to the water service box according to the present invention; and

FIG. 6 is a view illustrating usage of the water service box according to the present invention.

Best Mode for Carrying Out the Invention

Hereinafter, the present invention will be described in detail with reference to the attached drawings.

FIG. 1 is an exploded perspective view of the water service box according to the present invention. FIG. 2 is a sectional view of the assembled water service box.

5 Referring to the drawings, it will be observed that the water service box 1 according to the present invention comprises a case 2, in which flexible hoses 9 are provided, and a cover plate 12, which closes the case 2.

Each flexible hose 9 is coupled at a first end thereof to each soft pipe 34, which is a cold or hot water pipe. Furthermore, the first end of the flexible hose 9 is coupled
10 to a bellows pipe 8, which covers the soft pipe 34, using a reducing socket 6 and nuts 5 and 7.

A corner member 3, having an elliptical slot 4 therein, is provided at each corner of a front end of the case 2, such that the cover plate 12 is removably coupled to the case
2.

15 In detail, the cover plate 12 is fastened to the case 2 by tightening a locking member 18 both into each locking hole 17, which is formed in each corner of the cover plate 12, and into each elliptical slot 4. At this time, the position of the cover plate 12 is precisely adjusted using the four elliptical slots 4 formed in the corner members 3 before completing the process of coupling the cover plate 12 to the case 2.

20 The cover plate 12 is made of synthetic resin or metal. The cover plate 12 has on an outer surface thereof a plurality of frictional protrusions 19 such that mortar or tile can be applied to the cover plate 12. A repair hole 13, having a size appropriate for a user to put his/her hand into the repair hole 13, is formed at a predetermined position through the cover plate 12.

25 The repair hole 13 is typically formed by cutting out a portion of the cover plate 12 and by protruding a rim part 14 from an inner edge of the cover plate 12. Furthermore, the repair hole 13 may have an elliptical shape, a rectangular shape, or a hexagonal shape, etc., that is, it is not limited to any particular shape. The repair hole 13 is more preferably elliptical in view of appearance and practicality of use.

30 Additionally, an openable plate 21, which is slightly larger than the repair hole

13 so that the edge of the repair hole 13 can be covered by the openable plate 21 when closing the repair hole 13, is attached to the repair hole 13 of the cover plate 12.

On portions of the openable plate 21, ports 23 for the insertion of reducing sockets 22 (abbreviated as “socket insertion ports”) are formed. A stop protrusion 24 is provided around the edge of each port 23, so that each reducing socket 22 is securely coupled to a connector 11 of each flexible hose 9 using nuts 10 and 20 after the reducing socket 22 is fitted into the openable plate 21. (see the following description related to FIG. 5).

Further, the openable plate 21 is placed on the rim part 14 of the cover plate 12 such that a mounting hole 16 in a lower portion of the rim part 14 of the cover plate 12 and another mounting hole 25 in a lower portion of the openable plate 21 are aligned with each other, and a locking member 26 is inserted into the mounting holes 16 and 25. Thereafter, elliptical slots 25’ formed at right and left upper portions in the openable plate 21 are aligned with respective mounting holes 15 formed in the rim part 14 of the cover plate 12. Finally, after setting the exact position for the openable plate 21 by using the elliptical slots 25’, the openable plate 21 is attached and mounted on the rim part 14 of the cover plate 12 with locking members 26’.

Herein, since the slots 25’ formed at the right and left upper portions in the openable plate 21 are elliptical rather than circular, after slightly moving the openable plate 21 in the right or left direction to determine the exact setting position thereof in a state in which the mounting holes 16 and 25 are assembled together with the locking member 26, assembly is completed by fitting the locking member 26’ into the elliptical slots 25’. In addition, finishing caps 27 and 27’ are further fitted into the elliptical slots 25’ to improve the appearance thereof.

Subsequently, a connection pipe 29 having a cover 28 is fitted into each reducing socket 22, and a water tap 33 is coupled to each connection pipe 29 to complete the built-in wall water service box 1 having the water taps 33 according to the present invention.

Referring to FIG. 2, in the water service box 1 of the present invention installed inside the wall 30, in place of a typical rigid pipe made of metal or synthetic material, the

flexible hose 9 having improved flexibility and bendability is used for connecting the soft pipe 34, which extends from a lower portion of the wall 30, to the outside water tap 33.

5 The soft pipe 34, which is the cold or hot water pipeline that leads to the outside, is connected to a distributor (not shown), which is installed in a retaining wall or a masonry wall of each house. Furthermore, the soft pipe 34 is surrounded by the bellows pipe 8 and extends into the water service box 1 through the floor or the wall.

The flexible hose 9 is coupled to the openable plate 21 at an outlet thereof and is connected to the water tap 33, through which cold or hot water is finally discharged.

10 As described above, the openable plate 21 is fastened to the rim part 14 of the cover plate 12. In practice, when constructing the water service box 1, mortar 31 is applied to the front surface of the cover plate 12 after the cover plate 12 is coupled to the case 2 using locking units 18. Thereafter, tiles are attached to the mortar 31. The openable plate 21 is then coupled to the rim part 14, thus completing the construction process.

15 Herein, on the top side of the cover plate 12, a desired number of frictional protrusions 19, each having an appropriate size, is provided, so that mortar can be securely applied to the front surface of the cover plate 12 without moving, that is, without slipping down.

20 Alternatively, the outer surface of the water service box 1 may be finished by using the mortar 31 without the tiles 32. In this case, it is better to work the finishing process after completely assembling the cover plate 12 and the openable plate 21 with the case 2.

FIG. 3 is an enlarged view of a circled portion A of FIG 2 and shows that the flexible hose 9 is securely coupled with the reducing socket 22 fitted into the openable plate 21 at the outlet thereof through the connector 11.

As shown in the drawings, the front end of each connector 11 is fitted into each reducing socket 22 and coupled by the nut 10. Each reducing socket 22 is also coupled to the openable plate 21 using the nut 20 in the rim part 14.

30 Furthermore, a packing member 35, made of material such as rubber, is provided

on contact surfaces between the openable plate 21 and the rim part 14 of the cover plate 12, thus increasing the coupling force of the openable plate 21 to the rim part 14.

Returning to FIG. 3, the flexible hose 9 of the present invention has the general form of a hose comprising an outer surface 37 that has improved flexibility and bendability and is covered with stainless yarn 36, and in which a coil spring 38 is
5 installed, thus preventing the hose from breaking.

FIG. 4 illustrates an alternative example of the flexible hose mounted in the water service box according to the present invention. In this case, unlike the above example of FIG. 3, a coil spring 38' is provided on an outer surface of a flexible hose 9' covered
10 with stainless yarn 36'.

FIG. 5 is a view showing the mounting structure of the reducing socket 22 to the water service box 1 of the present invention.

The reducing socket 22 is a coupler, which is configured into a single body and includes a small diameter part 39 and a large diameter part 40. The reducing socket 22
15 has a hook notch 42 at a predetermined position on an upper edge 41 thereof.

Therefore, in order to connect the reducing sockets 47 to the flexible hoses 45, the small diameter part 39 and the large diameter part 40 of the reducing socket 22 are inserted into the socket insertion port 23 of the openable plate 21, such that the stop protrusion 24, which is provided adjacent to the socket insertion port 23 on the openable
20 plate 55, is inserted into the hook notch 42 formed in the reducing socket 22. Thereafter, the nut 20 is tightened to the large diameter part 40 on the rear surface of the openable plate 21. Subsequently, while the end of the connector 11 of the flexible hose 9 is brought into contact with the small diameter part 39, another nut 10, which is fitted over the flexible hose 9, is tightened to the small diameter part 39 of the reducing socket
25 22.

As a result, the flexible hose 9 is securely coupled to the reducing socket 22, the large diameter part 40 of which is fitted into the socket insertion port 23 of the openable plate 21. More particularly, since the stop protrusion 24 is fitted into the hook notch 42 of the reducing socket 22, even when a connection pipe 29 is coupled to the reducing
30 socket 22 to join the water tap 33 to the socket 22, the reducing socket 47 is prevented

from undesirably moving. Thereby, reliable connection between the reducing socket 22 and the water tap can be realized.

As described above, the water service box 1 according to the present invention comprises the case 2, which has therein the flexible hose 9 that couples the soft pipe 34 to the water tap 33, and the cover plate 12 which openably close the case 2. The repair hole 13 is formed through the cover plate 12. The openable plate 21, to which the reducing sockets 22 coupled to the respective flexible hoses 9 are mounted, is removably coupled to the cover plate 12. Therefore, the water service box 1 of the present invention makes the work of repairing the water service box 1 convenient because it only requires the openable plate 21 to be opened, without the need to fully open the cover plate 12.

Furthermore, when required, the user may put his/her hand into the repair hole 13 formed in the cover plate 12 and conduct the operation while directly checking the internal situation in the water service box 1. To repair the flexible hose 9 or to replace the soft pipe 34, which is the cold or hot water pipeline placed in the bellows pipe 8, with a new one, the user releases the joint of the distributor side and, subsequently, puts his/her hand into the repair hole 13 and pulls the flexible hose 9 outwards. Then, it is easily extracted outside from the water service box 1. As such, the present invention makes it possible for a user to easily conduct the repair or replacement process.

Meanwhile, FIG. 6 represents the usage of the water service box 1 according to the present invention. Referring to the drawing, the bellows pipe 8, which covers the soft pipe 34 which is a cold or hot water pipeline, is connected to the water service box 1 through the floor and the wall 30 in the distributor side. Furthermore, a water tap 33 such as a faucet is provided outside the water service box 1, such that it may be conveniently used.

The foregoing description of the preferred embodiments of this invention has been presented for the purposes of illustration and description. Obvious modifications or variations are possible in light of the above teaching. All such modifications and variations are within the scope of the present invention as determined by the appended claims when interpreted in accordance with the breadth to which they are fairly, legally,

and equitably entitled.

Industrial Applicability

As described above, in a built-in wall water service box of the present invention,
5 a flexible hose is coupled at a first end thereof to a soft pipe, covered with a bellows pipe, through a reducing socket and is coupled at a second end thereof to a water tap. A plurality of frictional protrusions is provided on a cover plate, and a repair hole is formed at a predetermined position through the cover plate. Furthermore, a rim part is provided around the repair hole, so that an openable plate is removably coupled to the rim part.
10 Another reducing socket, to which a connection pipe of the water tap is coupled, is inserted into a socket insertion port of the openable plate and is coupled to the openable plate using a stop protrusion of the openable plate. As well, the reducing socket coupled to the water tap is integrally coupled to the flexible hose. Therefore, the present invention enables convenient assembly and disassembly of the water service box,
15 compared to a conventional water service box in which only pipes are installed. Particularly, a user can directly inspect the inner condition of the water service box by putting his/her hands into the water service box through the repair opening. Thus, the present invention makes it possible for a user to easily judge the condition in the interior of the water service box and easily repair it. After such work is completed, the water
20 service box is simply finished with the openable plate.